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December 29, 2011 Reference No. 027545-00

Mr. Shawn Ghose
Remedial Project Manager
United States Environmental Protection Agency 6SF-RA
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202

Dear Mr. Ghose:

Re: Preliminary Evaluation of Remedial Alternatives
Star Lake Canal Superfund Site
Jefferson County, Texas
CERCLA Docket No. 06-02-06

Conestoga-Rovers & Associates (CRA) and Cardno ENTRIX, on behalf of Chevron Environmental Management Company (CEMC) and Huntsman Petrochemical LLC (Huntsman), submit herein to the U.S. Environmental Protection Agency (EPA) documents to support the preliminary evaluation of remedial alternatives for the Feasibility Study (FS) for the Star Lake Canal Superfund Site located in Jefferson County, Texas (Site). This correspondence includes a summary of the proposed scope and schedule for completion of the FS.

These documents are submitted in response to the EPA letter dated December 5, 2011. The EPA requested that remedial alternatives be developed to address Scenarios 10b and 11b developed during the sensitivity analysis for the Site. Scenarios 10b and 11b include remediation of all sediment sample locations with a sediment effects range median and probable effects level quotient (ERM/PEL-Q) Category of three or greater and all soil sample locations in the Jefferson Canal Spoil Pile Area of Investigation (AOI). Remedial action objectives (RAOs) for environmental protection in sediment and surface soil will be developed in the FS for review and approval by the EPA.

PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES

Table 1 includes a list of potential remedial alternatives to address sediment at the Site including containment, removal, treatment, natural recovery, and institutional controls. The remedial alternatives were selected based on their estimated potential to reduce constituent concentrations in Site sediment or to eliminate potential exposure pathways. The physical and chemical techniques for isolation or removal of impacted sediment are described briefly in Table 1. Each remedial alternative will be further evaluated during the FS for technical implementability, cost, and effectiveness in meeting the RAOs.

REMEDIAL ACTION OBJECTIVES

Tables 2 and 3 show the constituents of potential ecological concern (COPECs) that are driving the ecological risk at the Site based on the sediment ERM/PEL-Q. As shown in Tables 2 and 3, the primary and secondary drivers differ for many of the AOIs and sample locations across the Site and indicate that there are a number of COPECs that could be individually reduced to a concentration that would result in a lower ERM/PEL-Q Category ranking in each sediment sample area.

Further evaluation is required to establish the remediation goals that will be most effective at lowering the ERM/PEL-Q Category ranking while concurrently preventing collateral ecological damage potentially incurred by implementation of a remedial action. In the FS, these requirements will be identified prior to the detailed analysis of alternatives and will specify the constituents and media of interest, exposure pathways and receptors, and an acceptable constituent concentration or range of concentrations at particular locations for each exposure route.

PROPOSED PROJECT SCHEDULE

The proposed project schedule is attached for review. The schedule includes the most reasonable and efficient estimated time to complete the FS in accordance with EPA guidance. The proposed schedule assumes EPA concurrence with the approach described above for development of RAOs for the AOIs and sample locations across the Site.

Should you have any questions regarding this submittal, please contact CRA or Mr. Gary Jacobson of CEMC at (713) 432-2636.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

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cc: Gary Jacobson, Chevron
Jerry Hall, Chevron
Barry Gillespie, CardnoENTRIX

TABLE 1
PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

General Response Action (1)	*Technology type*	*Process Option* (2)	*Description of Process Option* (2)
No action	None	Not applicable	No action
Institutional controls	Non-engineered actions intended to reduce human exposure to sediments	Proprietary controls	Deed restrictions, easements, or covenants: tools based on property law to prohibit or control activities on the property
		Informational devices	Seafood consumption health advisories, public outreach, and education
		Enforcement tools	Government controls such as zoning restrictions, ordinances and permits that restrict land and waterway use (ex: no-dredging areas or no-anchoring areas)
		Site registry	Some states have a hazardous site registry that provides information on site-related property restrictions.
	Engineered actions intended to reduce human exposure to sediments	Access restrictions	Constraints, such as fencing and signs, to inhibit property access
Monitored natural recovery	Chemical/physical transport and degradation	Combined	Sorption, desorption, dispersion, diffusion, dilution, volatilization, resuspension, and transport
	Biological degradation	Metabolism of COCs by microorganisms	Metabolism by microorganisms occurs in aerobic and anaerobic environments. PCBs and pesticides may be dechlorinated, and PAHs may be partially or completely degraded.
	Physical burial processes	Burial by sedimentation and deposition	Sedimentation and/or deposition bury impaired sediments by natural processes. Deeper sediments become less bioavailable.
Enhanced natural recovery	Thin-layer placement	Application of a thin layer of clean material	Clean material overlying impaired sediments allows natural bioturbation and benthic recolonization. Mixing achieves acceptable COC concentrations.
	Enhanced thin layer cap	Application of a thin layer of clean material with amendments	Materials such as granulated activated carbon or iron filings are included in the clean material cap to provide sites for chemical binding of COCs when they migrate into sediment pore water.
Containment	*In Situ* capping	Conventional sand cap	Clean sand is placed over sediment to isolate impact and create a new benthic habitat.
		Conventional sediment or clay cap	Fine grained sediments or clays are placed over impaired sediment to isolate COCs.
		Armored cap	Cobbles, pebbles, or larger material is placed over sediment to prohibit bioturbation by burrowing organisms and to stabilize and prevent erosion or cap breaching.
		Composite cap	Soil, media, and geotextile (synthetic fabric for stability) cap is placed over sediments to inhibit migration of impaired pore water and to inhibit bioturbators.
		Spray cap	Concrete or mortar is sprayed at high velocity over sediment surface in either a wet or dry process.
		Reactive cap	Cap contains amendment materials such as activated carbon or apatite that inhibit mobilization of COCs via chemical binding.
Removal	Dredging	Hydraulic dredging	Sediment is loosened with a cutter head, bucket wheel, dustpan, auger, or hopper dredge. A pump provides suction to hydraulically move the sediment through a pipeline to a land location.
		Mechanical dredging	A dredging bucket extracts the sediment and raises it to the surface to be deposited on a barge.
		Hybrid or Specialty Dredging	Dredges specifically for environmental remediation combine aspects of both mechanical and hydraulic dredges. Examples are the Bonacavor Hydraulic Excavator, AMPHIBEX, Dry Dredge, Crawl Cat Cutter Suction Dredge, and Vic Vac.
	Dry Excavating	Excavator	Conventional backhoe equipment is used to remove sediment which has little water covering it, or sediment that has been dewatered by erecting sheet pile walls and cofferdams.

See notes at the conclusion of the table.

TABLE 1
PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

General Response Action [1]	*Technology type*	*Process Option* [2]	*Description of Process Option* [2]
In Situ treatment	Chemical	*In Situ* oxidation	Injection into sediment and mixing of oxidizing agents such as: permanganate (MnO^{4-}), Fenton's reagent (hydrogen peroxide [H_2O_2], ferrous iron [Fe^{+2}]), Ozone (O_3), and Persulfate ($S_2O_8^{2-}$) to oxidize organic COCs.
		Electrochemical oxidation	A low voltage AC/DC current is applied to sediment using a series of electrodes. The process stimulates mineralization of organic constituents and/or movement of metal constituents to the electrodes.
	Biological	*In Situ* slurry biodegradation	Aerobic, anaerobic, or aerobic/anaerobic sequential degradation of organic COCs by native or introduced microorganisms. Degradation is enhanced by controlling oxygen levels, nutrients, and pH. Slurry treatment would use aerators and/or mixers.
		In Situ aerobic or anaerobic biodegradation	Native populations of COC-degrading microorganisms are enhanced by the addition of (1) more microorganims, (2) nutritious mineral or biological amendments, or (3) a combination of these.
	Physical immobilization	Ground freezing	Freezing is induced by driving pipes through the sediment, circulating a refrigerant liquid through the pipes, and then excavation of the frozen soil.
		Solidification/Stabilization	Injection or mixing of binding agents such as portland cement, lime-kiln dust, gypsum, polymers, or other proprietary agents or methods to alter the chemical or physical characteristics of sediments and make COCs less available for ecological or human exposure.
Ex Situ treatment	Biological	Landfarming/Composting/Biodegradation	Landfarmed sediment is mixed with some of these: nutrients, enzymes, fungi, and, air. Sediment is spread over a treatment area where leachate is collected in a lined bed. Moisture, heat, oxygen, and pH can be managed to enhance biodegradation. Composting: organic amendments such as wood chips, straw, hay, corn cobs, potato waste, or alfala are added to enhance bacterial growth and biodegradation.
		Biopiles	Impaired sediment is stockpiled between 3 and 10 feet high. Microbial activity is stimulated with air, nutrients, straw, minerals, or moisture. Air is forced into the stockpiles by perforated pipes.
		Bioslurry Treatment	A slurry is created by mixing water with sediments. The slurry is mixed in a bioreactor to keep solids suspended and microorganisms in contact with COCs. Upon completion, the slurry is dewatered and the treated sediment is removed for disposal.
	Chemical	Acid Extraction	Some constituents adsorb onto the fines fraction of sediment. An extracting chemical, such as hydrochloric acid or sulfuric acid is used to extract constituents by dissolving them in the acid. It is also known as chemical leaching. The solid and liquid phases are then separated, and the solids are transferred to a rinse system, where they are rinsed with water to remove entrained acid and constituents. They are then dewatered and mixed with lime and fertilizer to neutralize any residual acid.
		Solvent Extraction	Solvent extraction separates constituents from sediment, reducing the volume of waste to be treated. Constituents are leached from sediment with organic solvents. Solvents may include kerosene, hexane, methanol, ethanol, isopropanol, propane, and butane. Solvent extraction generates three main product streams: constituents, separated solvent/water, and treated sediment.
		Slurry Oxidation	A slurry is created by mixing water with sediments and oxidizing agents to decompose organics. Oxidizing agents include ozone, hydrogen peroxide and Fenton's reagent. Upon completion, the slurry is dewatered and the treated sediment is removed for disposal.
	Chemical/Physical	Soil Washing	Most constituents bind to finer soil particles (clay and silt) rather than the larger particles (sand and gravel). Physical methods are used to separate the relatively clean larger particles from the finer particles. This process concentrates the COCs bound to the finer particles for further treatment. Sediment is screened to remove oversized particles and then homogenized. The sediment is mixed with a wash solution of water or water enhanced with chemical additives such as leaching agents, surfactants, acids, or chelating agents to help remove organic compounds and heavy metals. Particles are separated by size, concentrating the COCs with the fines.
		Dechlorination	Dechlorination removes chlorine from compounds such as PCBs. A chemical reagent is added to the sediment under alkaline conditions at temperatures of 110-340°C for several hours. The resulting products are less toxic than the original constituents. Vapors are removed from the processor, condensed, and further treated using activated carbon. The treated residue is rinsed to remove reactor by-products and reagent and is then dewatered prior to disposal.

See notes at the conclusion of the table.

TABLE 1
PRELIMINARY EVALUATION OF REMEDIAL ALTERNATIVES
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

General Response Action (1)	*Technology type*	*Process Option* (2)	*Description of Process Option* (2)
Ex Situ treatment (continued)	Physical	Solar Detoxification	Solar energy degrades organic compounds by direct thermal decomposition or by photochemical reaction. Solar radiation is reflected by mirrors (heliostats) and absorbed by a receiver reaching temperatures of up to 2000°C.
		Solidification/Stabilization	Physical stabilization processes alter the physical character of the sediments to form a solid material, which reduces the accessibility of the constituents to water and entraps the impaired solids within a stable matrix. Binders used to immobilize constituents in sediments include portland cement, pozzolans, bentonite, lime, plaster of paris, thermoplastic resins, and zeolites.
	Thermal	Pyrolysis	Solids are heated in the absence of oxygen. The pyrolysis system consists of a primary combustion chamber, a secondary combustion chamber, and pollution control devices. High temperatures decompose large, complex molecules into simpler ones. The resulting gaseous products can be collected (e.g., on a carbon bed) or destroyed in an afterburner. A solid coke residue of carbon and ash is produced.
		Incineration	Sediments are heated in the presence of oxygen to oxidize organic compounds. Higher temperature incineration (760°C) produces a dense slag or vitrified (glass-like) solid.
		High Pressure Oxidation	A combination of high temperature and pressure are used to break down organic compounds. Temperature ranges from 150°-600°C and pressures range from 2,000-22,300 Mpa.
		Thermal Desorption	Volatile and semivolatile compounds are physically separated from sediments by heating sediments to temperatures of 90 to 540°C. Water, organic compounds, and some volatile metals are vaporized and are then condensed and collected as liquid, captured on activated carbon, and/or destroyed in an afterburner.
		Vitrification	Sediment is treated with high temperature to cause melting and formation of a glass when cooled. Graphite electrodes are inserted into the contaminated sediment and energized with a high electrical resistance heating (more than 1,700°C) to melt sediment into a molten block.
Disposal	On-site or off-site disposal	Landfill/Beneficial use/Confined	Sediments are taken off-site to a landfill, used for a beneficial purpose after treatment, or confined to an isolated area on-site.

Notes:
(1) Remedial actions presented in this table are potential alternatives for sediments at the Site. Alternatives for Site soils will be presented under a separate analysis.
(2) Process options and their descriptions are intentionally presented as general categories in this table. These broad categories will be refined in the Feasibility Study as they are investigated and compared as required under CERCLA guidance.

TABLE 2
SEDIMENT EFFECTS RANGE MEDIAN AND PROBABLE EFFECTS LEVEL QUOTIENTS
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

Sample Location			*GSUC-7*	*JC-2*	*JC-7*	*JC-13*	*JC-18*	*JC-19*	*MB-10*	*MB-14*	*MB-18*	*MB-21*
Quotient	*Effects Range-Median*	*Probable Effects Level*	*ERM-Q*	*PEL-Q*	*PEL-Q*	*PEL-Q*	*PEL-Q*	*PEL-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*
Salt/Fresh			*Salt*	*Fresh*	*Fresh*	*Fresh*	*Fresh*	*Fresh*	*Salt*	*Salt*	*Salt*	*Salt*
Arsenic	70	17	0.161	0.641	0.344	1.076	0.829	0.322	0.136	0.159	0.131	0.132
Cadmium	9.6	3.53	0.059	0.217	0.089	0.201	0.487	0.277	0.093	0.071	0.032	0.039
Chromium	370	90	0.128	0.723	0.227	0.672	0.648	0.440	0.186	0.303	0.697	0.253
Copper	270	197	0.154	1.827	0.223	2.518	2.269	0.330	0.663	0.652	0.919	0.867
Lead	218	91.3	0.174	0.610	0.478	0.548	0.750	1.424	0.757	1.188	**1.078**	0.972
Mercury	0.71	0.486	0.081	0.434	0.094	0.385	0.198	0.218	0.999	1.211	0.803	2.085
Nickel	51.6	35.9	0.570	0.730	0.543	0.866	0.482	0.432	0.535	0.841	0.769	0.568
Silver	3.7*	-	0.186	-	-	-	-	-	0.511	0.522	0.378	0.789
Zinc	410	315	0.310	1.178	0.159	0.727	1.378	0.303	0.400	0.571	0.722	0.512
Total PCBs (Aroclors)	0.18	0.277	-	3.177	14.079	-	-	-	4.333	15.556	0.139	8.333
4,4'-DDE	0.027	0.00675	0.048	2.667	**69.630**	9.778	10.222	**9.185**	0.481	0.363	0.059	0.407
4,4'-DDT	0.007	-	0.186	-	-	-	-	-	2.286	2.000	-	-
Dieldrin	0.008	0.00667	0.163	0.120	**55.472**	11.394	10.345	**9.295**	0.825	2.500	0.200	1.875
Acenaphthene	0.5	-	**2.800**	-	-	-	-	-	**110.000**	**50.000**	0.166	**220.000**
Acenaphthylene	0.64	-	2.031	-	-	-	-	-	26.563	48.438	**8.750**	75.000
Anthracene	1.1	0.845~	1.545	7.219	0.615	4.852	87.574	2.959	23.636	40.909	1.000	52.727
Benzo(a)anthracene	1.6	0.385	0.688	11.169	1.662	**24.416**	70.130	2.857	6.875	9.375	0.500	11.875
Benzo(a)pyrene	1.6	0.782	0.469	3.964	0.217	9.335	21.739	2.430	3.563	5.625	0.688	4.813
Chrysene	2.8	0.862	0.464	5.104	1.160	12.761	30.162	1.972	3.929	5.357	0.393	7.500
Dibenz(a,h)anthracene	0.26	-	0.385	-	-	-	-	-	3.115	0.885	0.577	3.077
Fluoranthene	5.1	2.355	0.412	4.076	0.807	8.068	21.231	0.892	4.510	7.843	0.235	9.216
Fluorene	0.54	-	0.050	-	-	-	-	-	**96.296**	25.926	0.759	**185.185**
Naphthalene	2.1	-	0.030	-	-	-	-	-	32.381	0.243	0.042	61.905
Phenanthrene	1.5	0.515	**2.200**	**33.010**	19.417	1.592	**524.272**	0.951	73.333	**73.333**	0.367	146.667
Pyrene	2.6	0.875	1.538	**21.714**	5.257	**35.429**	**148.571**	8.229	21.538	30.769	0.615	35.000
Mean ERM Quotient (ERM-Q)			**0.618**	**5.477**	**9.471**	**7.330**	**54.782**	**2.501**	**16.718**	**12.986**	**0.834**	**34.575**
Category Ranking: Mean ERM-Q			**3**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**4**

= Primary driver

= Secondary driver

TABLE 2
SEDIMENT EFFECTS RANGE MEDIAN AND PROBABLE EFFECTS LEVEL QUOTIENTS
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

Sample Location			*MB-24*	*MB-26*	*MB-49*	*MB-51*	*MB-52*	*MB-54*	*MB-56*	*MB-58*	*MB-59*	*MB-60*
Quotient	*Effects Range-Median*	*Probable Effects Level*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*
Salt/Fresh			*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*
Arsenic	70	17	0.088	0.116	0.160	0.112	0.108	0.121	0.193	0.081	0.153	0.146
Cadmium	9.6	3.53	0.031	0.059	0.067	0.058	0.169	0.163	0.080	0.065	0.055	0.163
Chromium	370	90	0.079	1.027	0.711	0.400	0.362	0.492	0.846	0.397	0.665	0.430
Copper	270	197	0.168	1.552	0.722	0.604	0.700	0.704	1.452	0.648	0.763	0.737
Lead	218	91.3	0.142	**1.670**	0.505	0.532	0.537	0.702	1.358	0.610	**1.413**	0.876
Mercury	0.71	0.486	0.328	0.955	0.414	0.861	0.503	0.446	2.225	0.889	0.889	0.662
Nickel	51.6	35.9	0.378	1.196	0.669	0.448	0.465	0.574	0.992	0.541	1.016	0.659
Silver	3.7*	-	0.208	0.878	0.226	0.370	0.167	0.195	0.732	0.206	0.173	0.261
Zinc	410	315	0.212	0.956	0.420	0.295	0.461	0.480	0.820	0.407	0.734	0.571
Total PCBs (Aroclors)	0.18	0.277	0.556	0.944	-	-	-	-	-	-	-	-
4,4'-DDE	0.027	0.00675	0.278	0.074	0.278	0.248	0.226	0.259	1.185	0.170	0.519	0.356
4,4'-DDT	0.007	-	-	-	**1.071**	0.957	0.871	1.000	6.429	0.214	0.900	1.371
Dieldrin	0.008	0.00667	0.938	0.250	0.938	0.838	0.763	**4.125**	1.138	0.188	0.788	**2.875**
Acenaphthene	0.5	-	**22.000**	0.070	0.190	0.140	**1.660**	0.560	**26.000**	0.520	0.220	1.540
Acenaphthylene	0.64	-	**9.844**	**5.781**	**4.531**	**6.719**	**2.656**	**3.438**	17.188	**7.656**	**5.000**	**3.906**
Anthracene	1.1	0.845~	4.000	0.336	0.709	0.473	0.882	1.091	18.182	**1.182**	0.855	1.545
Benzo(a)anthracene	1.6	0.385	0.813	0.138	0.150	0.875	0.481	0.619	5.625	0.813	0.256	0.625
Benzo(a)pyrene	1.6	0.782	0.544	0.288	0.356	**1.000**	0.394	0.400	4.250	0.813	0.275	0.475
Chrysene	2.8	0.862	0.750	0.164	0.236	0.571	0.393	0.536	3.143	0.500	0.214	0.500
Dibenz(a,h)anthracene	0.26	-	0.300	0.312	0.358	0.692	0.538	0.462	1.308	0.923	0.500	0.538
Fluoranthene	5.1	2.355	0.922	0.073	0.145	0.294	0.294	0.471	4.118	0.314	0.182	0.431
Fluorene	0.54	-	1.667	0.333	0.630	0.389	0.046	0.052	22.222	0.056	0.046	0.981
Naphthalene	2.1	-	2.667	0.021	0.032	0.052	0.062	0.039	0.452	0.219	0.052	0.210
Phenanthrene	1.5	0.515	9.333	0.133	0.107	0.347	1.067	0.200	**50.667**	0.587	0.287	0.527
Pyrene	2.6	0.875	3.500	0.292	0.288	0.962	0.769	0.885	14.231	0.577	0.196	1.346
Mean ERM Quotient (ERM-Q)			**2.489**	**0.734**	**0.580**	**0.760**	**0.607**	**0.750**	**7.701**	**0.774**	**0.673**	**0.905**
Category Ranking: Mean ERM-Q			**4**	**3**	**3**	**3**	**3**	**3**	**4**	**3**	**3**	**3**

= Primary driver

= Secondary driver

TABLE 2
SEDIMENT EFFECTS RANGE MEDIAN AND PROBABLE EFFECTS LEVEL QUOTIENTS
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

Sample Location			*MB-61*	*MB-62*	*MB-63*	*SL-6*	*SL-7*	*SL-9*	*SL-10*	*SLC-6*	*SLC-11*
Quotient	*Effects Range-Median*	*Probable Effects Level*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*	*ERM-Q*
Salt/Fresh			*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*	*Salt*
Arsenic	70	17	0.196	0.247	0.138	0.149	0.116	0.098	0.083	0.112	0.080
Cadmium	9.6	3.53	0.239	0.042	0.036	0.028	0.033	0.038	0.044	0.057	0.028
Chromium	370	90	0.354	0.689	0.357	0.470	0.700	1.768	0.643	0.240	0.182
Copper	270	197	0.719	0.689	0.611	0.128	0.186	0.283	0.404	2.352	0.626
Lead	218	91.3	0.835	1.931	0.752	5.688	3.693	3.706	2.739	0.537	0.201
Mercury	0.71	0.486	0.920	1.535	1.690	0.508	0.715	1.944	0.479	3.761	0.615
Nickel	51.6	35.9	0.783	1.267	0.659	0.227	0.326	0.442	0.384	0.640	0.494
Silver	3.7*	-	0.370	0.327	0.405	0.824	1.273	1.497	0.768	0.486	0.088
Zinc	410	315	0.641	0.861	0.524	0.680	0.500	0.746	0.476	0.459	0.268
Total PCBs (Aroclors)	0.18	0.277	-	-	-	-	-	-	-	**11.667**	-
4,4'-DDE	0.027	0.00675	0.363	**11.111**	2.556	**40.741**	**100.000**	2.630	**4.815**	0.667	0.519
4,4'-DDT	0.007	-	1.400	2.857	1.157	8.429	82.857	0.614	2.857	**14.286**	**1.714**
Dieldrin	0.008	0.00667	**2.625**	**25.000**	5.500	**100.000**	**212.500**	**7.500**	2.500	0.888	0.625
Acenaphthene	0.5	-	0.740	0.300	2.200	0.196	0.760	0.520	0.320	0.200	0.260
Acenaphthylene	0.64	-	**9.375**	8.438	**87.500**	7.344	42.188	**12.969**	**10.000**	0.875	**2.500**
Anthracene	1.1	0.845~	1.455	1.091	3.364	1.000	3.909	1.636	1.727	0.191	0.282
Benzo(a)anthracene	1.6	0.385	1.125	0.594	11.875	0.225	0.263	0.250	0.875	0.506	0.450
Benzo(a)pyrene	1.6	0.782	1.188	0.750	15.625	0.313	0.531	0.450	0.875	0.369	0.494
Chrysene	2.8	0.862	0.714	0.429	8.214	0.161	0.121	0.100	0.643	0.786	0.243
Dibenz(a,h)anthracene	0.26	-	1.308	0.846	5.385	0.165	0.538	0.346	0.654	0.654	0.500
Fluoranthene	5.1	2.355	0.471	0.353	5.294	0.084	0.067	0.076	0.412	0.804	0.353
Fluorene	0.54	-	0.072	0.037	0.030	0.685	3.148	1.389	1.185	0.741	0.796
Naphthalene	2.1	-	0.090	0.067	0.952	0.040	0.090	0.062	0.081	0.026	0.036
Phenanthrene	1.5	0.515	0.580	0.433	2.800	0.193	0.307	0.253	1.467	0.193	0.267
Pyrene	2.6	0.875	1.385	0.423	**17.692**	0.462	0.242	0.377	1.500	0.731	0.500
Mean ERM Quotient (ERM-Q)			**1.164**	**2.513**	**7.305**	**7.031**	**18.961**	**1.654**	**1.497**	**1.689**	**0.505**
Category Ranking: Mean ERM-Q			**3**	**4**	**4**	**4**	**4**	**4**	**3**	**4**	**3**

= Primary driver

= Secondary driver

TABLE 3
ERM/PEL-Q COPEC DRIVERS IN SAMPLES WITH AN ERM/PEL-Q CATEGORY RANKING GREATER THAN TWO
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

Sample Location	*Arsenic*	*Cadmium*	*Chromium*	*Copper*	*Lead*	*Mercury*	*Nickel*	*Silver*	*Zinc*	*Total PCBs (Aroclors)*	*4,4'-DDE*	*4,4'-DDT*	*Dieldrin*	*Acenaphthene*
GSUC-7														1
JC-2														
JC-7											1		2	
JC-13														
JC-18														
JC-19											2		1	
MB-10														1
MB-14														2
MB-18					2									
MB-21														1
MB-24														1
MB-26					2									
MB-49												2		
MB-51														
MB-52														2
MB-54													1	
MB-56														2
MB-58														
MB-59					2									
MB-60													2	
MB-61													2	
MB-62											2		1	
MB-63														
SL-6											2		1	
SL-7											2		1	
SL-9													2	
SL-10											2			
SLC-6										2		1		
SLC-11												2		

Notes:

1= Primary driver

2 = Secondary driver

TABLE 3
ERM/PEL-Q COPEC DRIVERS IN SAMPLES WITH AN ERM/PEL-Q CATEGORY RANKING GREATER THAN TWO
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

Sample Location	*Acenaphthylene*	*Anthracene*	*Benzo(a)anthracene*	*Benzo(a)pyrene*	*Chrysene*	*Dibenz(a,h)anthracene*	*Fluoranthene*	*Fluorene*	*Naphthalene*	*Phenanthrene*	*Pyrene*
GSUC-7										2	
JC-2										1	2
JC-7											
JC-13			2								1
JC-18										1	2
JC-19											
MB-10								2			
MB-14										1	
MB-18	1										
MB-21								2			
MB-24	2										
MB-26	1										
MB-49	1										
MB-51	1			2							
MB-52	1										
MB-54	2										
MB-56										1	
MB-58	1	2									
MB-59	1										
MB-60	1										
MB-61	1										
MB-62											
MB-63	1										2
SL-6											
SL-7											
SL-9	1										
SL-10	1										
SLC-6											
SLC-11	1										

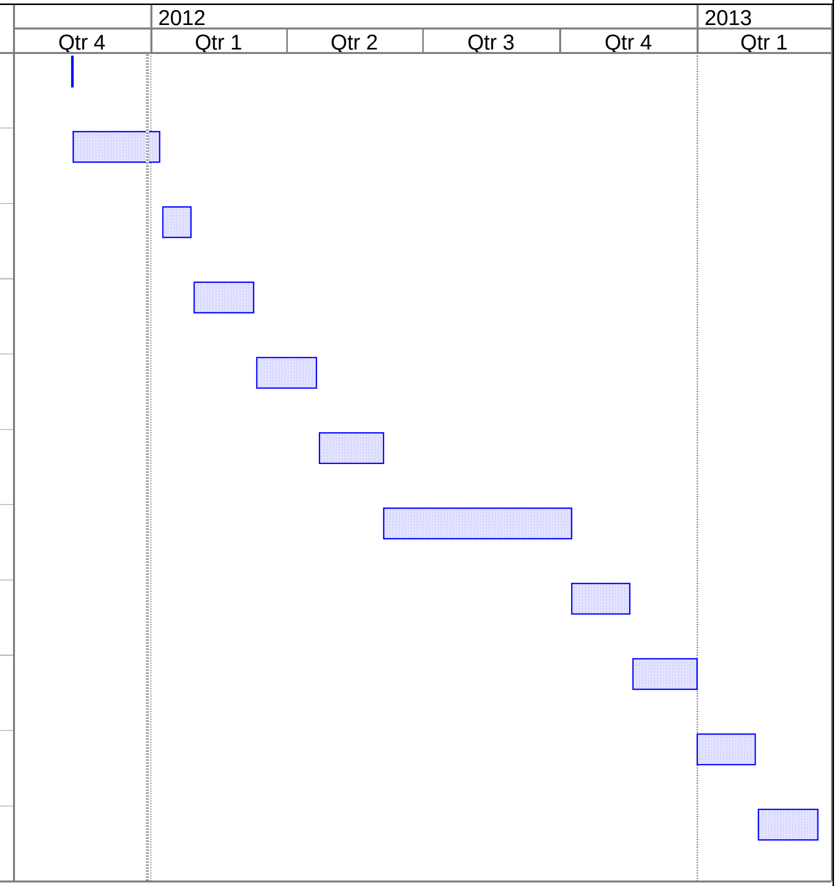
Notes:

1= Primary driver

2 = Secondary driver

PROPOSED PROJECT SCHEDULE (REVISED DECEMBER 29, 2011)
FEASIBILITY STUDY
STAR LAKE CANAL SUPERFUND SITE
JEFFERSON COUNTY, TEXAS

ID	Task Name	Duration	Start	Finish
1	Agency Approval of Final Tier 2 RI Report	1 day	Wed 11/9/11	Wed 11/9/11
2	Submittal of Preliminary Evaluation of Remedial Alternatives	42 days	Thu 11/10/11	Fri 1/6/12
3	Submittal of Draft Feasibility Study Work Plan	15 days	Mon 1/9/12	Fri 1/27/12
4	Draft Feasibility Study Agency Review Comment and Response Period	30 days	Mon 1/30/12	Fri 3/9/12
5	Revision and Submittal of Final Feasibility Study Work Plan	30 days	Mon 3/12/12	Fri 4/20/12
6	Agency Approval of Final Feasibility Study Work Plan (Assumed)	31 days	Mon 4/23/12	Mon 6/4/12
7	Completion of Feasibility Study	90 days	Tue 6/5/12	Mon 10/8/12
8	Preparation and Submittal of Draft Feasibility Study Report	29 days	Tue 10/9/12	Fri 11/16/12
9	Draft Feasibility Study Report Agency Review Comment and Response Period	31 days	Mon 11/19/12	Mon 12/31/12
10	Preparation and Submittal of Final Feasibility Study Report	29 days	Tue 1/1/13	Fri 2/8/13
11	Agency Approval of Final Feasibility Study Report	30 days	Mon 2/11/13	Fri 3/22/13



Project: 27545-00

Task

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